

DIRECT TESTIMONY OF
JOHN H. RAFTERY
ON BEHALF OF
SOUTH CAROLINA ELECTRIC & GAS COMPANY
DOCKET NO. 2018-2-E

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
2 **OCCUPATION.**

3 A. My name is John Raftery. My business address is 220 Operation Way, Cayce,
4 South Carolina. I am General Manager of Renewable Products/Services and Energy
5 Demand Management for South Carolina Electric & Gas Company (“SCE&G” or
6 the “Company”).
7

8 **Q. STATE BRIEFLY YOUR EDUCATION, BACKGROUND, AND**
9 **EXPERIENCE.**

10 A. I am a graduate of Northwestern University with a Bachelor of Science
11 degree in Mechanical Engineering. I began my public utilities career in 1994 as an
12 Information Technology Management Consultant with Price Waterhouse and
13 continued with Oracle Corporation in 1998. I joined SCANA Corporation in 2003
14 as a Client Manager in the Customer Systems Support Organization and gained the
15 responsibilities of the Customer Service Training Department several years later. In
16 2010, I assumed responsibility for the SCANA Contact Centers and Technology

1 Services, with the addition of SCE&G's Business Offices in 2013. In 2014, I
2 assumed my current role as General Manager of Renewable Products/Services and
3 Energy Demand Management.

4
5 **Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC SERVICE**
6 **COMMISSION OF SOUTH CAROLINA (THE "COMMISSION")?**

7 A. Yes, I have testified before the Commission in support of SCE&G's Petition
8 for Approval to Participate in a Distributed Energy Resource Program in Docket
9 No. 2015-54-E and in the prior two fuel proceedings.

10
11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

12 A. The purpose of my testimony is to discuss the performance and costs
13 associated with SCE&G's Distributed Energy Resources ("DER") programs during
14 the review period of January 1, 2017, through December 31, 2017 ("Review
15 Period"). I also provide the DER program cost projections for the forecast period
16 January 1, 2018, through April 30, 2019 ("Forecast Period"). Finally, I describe the
17 Company's plans to issue Requests for Proposals ("RFPs") to invest in renewable
18 energy facilities pursuant to S.C. Code Ann. § 58-39-130(D).

1 **Q. UNDER WHAT AUTHORITY DID THE COMPANY IMPLEMENT DER**
2 **PROGRAMS?**

3 A. In Docket No. 2015-54-E, the Company sought authorization of the
4 Commission to participate in a DER program under the South Carolina Distributed
5 Energy Resource Act (“Act 236”). In Order No. 2015-512, the Commission granted
6 the Company’s petition and concluded that SCE&G’s proposed DER Programs, as
7 modified by the Settlement Agreement entered into by the parties of record to that
8 proceeding, were reasonable and prudent. In approving the Settlement Agreement,
9 the Commission also determined that these programs would result in the
10 development of approximately 42 megawatts (“MW”) of renewable energy facilities
11 sized between one and ten MW (“Utility-scale”) and approximately 42 MW of
12 renewable energy facilities sized less than one MW (“Customer-scale”). The
13 Company subsequently implemented its first DER programs on October 7, 2015,
14 with retroactive sign-up availability to those customer installations after January 1,
15 2015, if they so chose.

DER PROGRAM COSTS

Q. PLEASE DESCRIBE THE DER PROGRAM COSTS THAT WERE INCURRED BY SCE&G DURING THE REVIEW PERIOD AND THAT THE COMPANY PROJECTS TO INCUR DURING THE FORECAST PERIOD.

A. During the Review Period, the Company offered customers a variety of solar programs approved by the Commission in Order No. 2015-512. In addition, SCE&G has taken steps to develop its Community Solar DER program. As a result of these efforts, the balance of DER program costs at the end of the Review Period totaled \$(1,504,690) in avoided costs and \$798,039 in incremental costs. For the period January 1, 2018, through April 30, 2019, the Company projects that DER Program costs will include \$9,304,269 in avoided costs and \$25,313,951 in incremental costs.

Q. WHAT ARE AVOIDED AND INCREMENTAL COSTS?

A. Section 58-39-120(B) defines “avoided costs” as meaning “payments for purchases of electricity made according to an electrical utility’s most recently approved or established avoided cost rates in this State or rates negotiated pursuant to PURPA, in the year the costs are incurred, for purchases of electricity from qualifying facilities pursuant to Section 210 of [PURPA]....” “Incremental costs” are defined by S.C. Code Ann. § 58-39-140(A) as meaning “all reasonable and prudent costs incurred by an electrical utility to implement a distributed energy resource program ... including, but not limited to:

- (1) The cost an electrical utility incurs in excess of the electrical utility's avoided cost rate ...;
- (2) The full cost of an electrical utility's investment in nongenerating distributed energy resources ...;
- (3) The electrical utility's weighted average cost of capital as applied to the electrical utility's investment in distributed energy resources ...;
- (4) Operating and maintenance expenses, taxes, insurance, depreciation, overheads, and all other expenses properly considered to be expenses associated with a project, asset, or program under generally accepted principles of regulatory, or utility accounting or accounting orders issued by the commission ...; [and]
- (5) The electrical utility's incremental labor cost associated with implementing a distributed energy resource program."

Q. WHAT DO THESE COSTS INCLUDE?

A. These costs include the avoided and incremental costs associated with SCE&G's approved DER programs, including 1) offering Utility-scale DER programs; 2) offering Customer-scale Net Energy Metering ("NEM") incentives, Performance Based Incentives ("PBIs") and Bill Credit Agreement ("BCA") programs; and 3) developing the Company's Community Solar program. These costs also include general and administrative expenses directly resulting from offering DER programs to the Company's customers, such as information

1 technology system enhancements, revenue-grade meters, marketing and education
 2 expenses, and the incremental labor required to support the programs and increased
 3 volume of customer inquiries. Company Witness Allen Rooks provides these cost
 4 components in his testimony.

5
 6 **Q. DURING THE REVIEW PERIOD, DID THE COMPANY OFFER ANY**
 7 **EDUCATIONAL PROGRAMS TO ITS CUSTOMERS AND SOLAR**
 8 **INSTALLERS ABOUT THE DER PROGRAMS?**

9 A. Yes. SCE&G conducted well over thirty customer, community, municipal,
 10 and industry education events on the Company's DER program offerings and how
 11 they could benefit from renewable energy. These events included, among others,
 12 the following organizations:

- 13 • South Carolina Office of Regulatory Staff;
- 14 • South Carolina Energy Office State Energy Plan;
- 15 • South Carolina Office of Economic Opportunity;
- 16 • SCE&G's DER Collaborative Group;
- 17 • SCE&G's Nonprofit Solar Council;
- 18 • South Carolina Solar Council;
- 19 • South Carolina Chamber of Commerce for Economic Development;
- 20 • South Carolina Environmental Energy Forum;
- 21 • SC Clean Energy Business Alliance DER Panel;
- 22 • SC Clean Energy Business Alliance Energy Storage Roundtable;
- 23 • SC Clean Energy Business Alliance Clean Energy Summit;
- 24 • US Department of Energy SunShot for Reducing Soft Costs;
- 25 • Multiple K-12 Classrooms;
- 26 • Multiple Municipalities, Churches and Schools;
- 27 • Multiple Rotary Clubs;
- 28 • Clean Energy Collective Utility Advisory Council;
- 29 • City of Columbia Green Business Council;
- 30 • Community Solar Best Practices Summit;

- Smart Electric Power Association;
- Southeast Clean Power Summit;
- Southern States Energy Board;
- Southeastern Wind Coalition; and
- Clemson University Electric Power Research Association.

SCE&G also conducted numerous personal customer visits, attended several Home Owners' Association meetings, and made multiple county and civic presentations.

For its leadership and success in developing solar energy programs, SCE&G was recognized by the South Carolina Clean Energy Business Alliance in September 2017 with a statewide award for Outstanding Achievement and Leadership.

UTILITY-SCALE DER PROGRAMS

Q. PLEASE UPDATE THE COMMISSION ON THE COMPANY'S PROGRESS TOWARD MEETING ITS UTILITY-SCALE DER GOALS AS OF THE END OF THE REVIEW PERIOD.

A. As of December 31, 2017, nine solar farms totaling 48.16 MW have been constructed and interconnected to SCE&G's distribution system as part of the Company's approved DER program. As such, SCE&G has achieved the 1% goal for Utility-scale facilities set forth in Act 236.

CUSTOMER-SCALE DER PROGRAMS

Q. PLEASE UPDATE THE COMMISSION ON THE COMPANY'S PROGRESS TOWARD MEETING ITS CUSTOMER-SCALE DER GOALS AS OF THE END OF THE REVIEW PERIOD.

A. To accomplish its Customer-scale DER goals, SCE&G offers its residential and non-residential customers a new retail net energy metering program ("NEM 2.0"), through which customers receive bills that are equivalent to bills that the customers would have had if the customers received a credit for each kilowatt-hour ("kWh") generated by their renewable resources that is equal to the price that is charged per kWh for the energy consumed. The difference between the value of net metered customer generation, as determined using the methodology approved in Docket No. 2014-246-E, and the customer's retail rate is recoverable as a DER incentive.

As of December 31, 2017, 6,075 SCE&G customers (6,021 residential and 54 non-residential) were participating in the Company's NEM 2.0, as compared to 2,748 participating customers as of December 31, 2016. Participation in NEM 2.0 accounts for approximately 46.97 MW of solar generating capacity (approximately 43.27 MW from residential and approximately 3.70 MW from non-residential) on SCE&G's system.

For residential customers participating in NEM 2.0, the Company also offered the opportunity to reserve—on a first-come, first-serve basis for up to a cumulative total of 9 MW of reserved capacity—a Performance Based Incentive

1 (“PBI”). The available PBIs were fully reserved, and as of December 31, 2017,
2 1,085 of the NEM 2.0 residential customers (included in the residential customer
3 count above) with generating capacity totaling approximately 8.09 MW (included
4 in the generating capacity total above) were receiving the PBI. The remaining
5 reservations have expired.

6 As an alternative to NEM 2.0, SCE&G also offers its non-residential
7 customers the opportunity to participate in its Bill Credit Agreement (“BCA”)
8 program in which all energy produced by the customer’s generator is delivered to
9 the SCE&G electrical system, and the customer is compensated at tiered,
10 incentivized rates directly on the customer’s SCE&G bill. As of December 31,
11 2017, SCE&G had 86 BCA customers totaling 9.84 MW in generating capacity. By
12 Order No. 2017-246, the BCA program was indefinitely suspended to systems
13 without approved applications and interconnection agreements by April 27, 2017.
14 Those BCA systems holding approvals must be interconnected according to their
15 approved BCA program application and interconnection agreement by April 27,
16 2018. This constitutes an additional 39 systems totaling approximately 13.56 MW
17 of capacity.

18 In sum, as of December 31, 2017, SCE&G had 6,161 customers (6,021
19 residential and 140 non-residential) participating in its Customer-scale DER
20 programs. This customer participation represented approximately 56.81 MW of
21 solar generating capacity on SCE&G’s system. As such, SCE&G has achieved the
22 1% goal for Customer-scale facilities set forth in Act 236.

1 **Q. WHAT WAS THE TOTAL CUMULATIVE NEM GENERATING**
2 **CAPACITY ON SCE&G'S SYSTEM AS OF DECEMBER 31, 2017?**

3 A. As of December 31, 2017, the total cumulative NEM generating capacity
4 provided by the 6,308 net metering customer-generator facilities on SCE&G's
5 system was approximately 48.03 MW, or approximately 1.14% of the Company's
6 previous five-year average peak demand of 4,225 MW. Of this total, approximately
7 1.06 MW of solar generating capacity comes from the 233 "NEM 1.0" participants,
8 who have elected to remain on the net metering tariff in effect at the time NEM 2.0
9 was approved. Pursuant to S.C. Code Ann. § 58-40-20(A), these NEM 1.0
10 customers can remain on this rate schedule through December 31, 2020, after which
11 time the NEM 1.0 rate will close and they will be required to move to any available
12 rate schedule for which they qualify.

13
14 **Q. WHEN DOES SCE&G ANTICIPATE MEETING ACT 236'S NET**
15 **METERING LIMIT OR CAP OF 2%?**

16 A. Based on NEM adoption levels and trends experienced since July 1, 2016,
17 SCE&G presently forecasts that it will approach the 2% cap in April or May of
18 2019.

19 Pursuant to the Settlement Agreement in Docket No. 2016-246-E, SCE&G
20 will file new net metering tariffs to replace the existing tariffs no later than January
21 31, 2020.

COMMUNITY SOLAR

**Q. PLEASE UPDATE THE COMMISSION ON THE PROGRESS OF
SCE&G'S COMMUNITY SOLAR PROGRAM.**

A. By Order No. 2016-707, the Commission approved the Credit Rate Agreement between SCE&G and Clean Energy Collective, LLC ("CEC") whereby CEC is authorized to develop, build and market up to 16 MW of community solar renewable generating facilities. The individual solar panels in these facilities are available for SCE&G customers to either purchase or subscribe to their energy output as a credit on their SCE&G bills.

CEC is actively constructing the following three community solar facilities:

- Springfield Solar, in Orangeburg County, is a 6 MW facility with a targeted operations date of Q2 2018.
- Nimitz Solar, in Jasper County, is an 8 MW facility with a targeted operations date of Q2 2018.
- Curie Solar, in Hampton County, is a 2 MW facility with a targeted operations date of Q1 2019.

As of February 15, 2018, the following number of customers and associated MW of capacity have either been purchased or subscribed to in the three community solar facilities. The remaining 0.474 MW of capacity is reserved for Low-Income customers and continues to be marketed through SCE&G, CEC, and 8 Customer Assistance Agencies.

Segment	Customers	Capacity (MW)
Low-Income	95	0.526
Residential	903	5.550
Church, School, Municipal	22	9.450
Total	1,023	15.536

UTILITY INVESTMENT DER PROGRAMS

Q. CONSIDERING THAT BOTH THE 1% CUSTOMER-SCALE AND 1% UTILITY-SCALE GOALS HAVE BEEN MET, IS SCE&G EXPLORING MOVING FORWARD WITH THE ADDITIONAL 1% UTILITY-SCALE INVESTMENT CONTEMPLATED IN S.C. CODE ANN. § 58-39-130(D)?

A. Yes. With 718 MW in signed Power Purchase Agreements (PPAs) in Utility-scale DER and PURPA Qualifying Facilities as of February 23, 2018, and with two PPAs totaling approximately 147 MW expected to be executed prior to the hearing in this matter, SCE&G expects the nameplate capacity of the intermittent solar generating facilities with executed PPAs to represent approximately 17% of the Company's 2018 forecasted system peak demand of 5,077 MW. As a result of this high penetration, SCE&G has determined the need to explore pricing and performance characteristics of solar photovoltaic systems coupled with battery energy storage on its system and presently plans to issue RFPs for solar photovoltaic systems coupled with battery energy storage.

1 **Q. WHAT ADVANTAGES MIGHT SOLAR PHOTOVOLTAIC SYSTEMS**
2 **COUPLED WITH BATTERY ENERGY STORAGE PROVIDE TO**
3 **SCE&G?**

4 A. These battery energy storage systems could provide the ability to store the
5 currently non-dispatchable, non-schedulable solar power production when the grid
6 does not require the excess energy, and then re-dispatch that power from the
7 batteries when needed most across the grid. Battery energy storage systems may
8 also provide additional voltage and reactive power regulation options, frequency
9 regulation, and the smoothing of intermittent solar generation.

10 By issuing an RFP for these combined systems, SCE&G expects to receive
11 not only competitive pricing, but also industry insight into best practices for
12 deployment and ancillary services they may provide. If SCE&G identifies
13 competitive projects that provide system benefits, SCE&G anticipates applying to
14 the Commission for approval to move forward with the contracts and deployment.
15 The data gained from such systems will enable the Company to understand the best
16 integration of clean, intermittent generators at the lowest cost possible.

17
18 **Q. ARE THERE ANY OTHER PROGRAMS SCE&G IS EXPLORING WITH**
19 **RESPECT TO THE ADDITIONAL 1% UTILITY-SCALE INVESTMENT?**

20 A. Yes. Located at the Saluda Hydro Generating Station is the Lake Murray
21 Training Center. This facility is used to train utility linemen and substation
22 electricians. In 2015 a coal ash landfill was capped adjacent to this facility and the

1 topmost portion was prepped for a potential solar farm. This site is ideal because
2 of its shared footprint with a local substation and training facilities for Company
3 linemen, as well as its highly visible location for pedestrians and motorists crossing
4 the Lake Murray Dam each day. This high visibility will help promote solar
5 awareness among the general public. In conjunction with a possible solar farm,
6 SCE&G envisions a microgrid integrating advanced technologies such as lithium
7 ion battery energy storage, fuel cells and flow batteries. As defined by the U.S.
8 Department of Energy Microgrid Exchange Group, “[a] microgrid is a group of
9 interconnected loads and distributed energy resources within clearly defined
10 electrical boundaries that acts as a single controllable entity with respect to the grid.
11 A microgrid can connect or disconnect from the grid to enable it to operate in both
12 grid-connected or island mode.” Microgrid capabilities include circuit-level grid
13 support, power quality, reliability and resiliency, and temporary back-up energy
14 supply.

15 SCE&G envisions that a solar farm at the Lake Murray site would work in
16 concert with SCE&G’s distribution system to provide a replicable resilient electric
17 power microgrid and give utility engineers and workers a system on which to study
18 and train. Through an RFP for the first stage of a solar farm, battery energy storage,
19 microgrid and emerging technologies site prep, SCE&G expects to receive not only
20 competitive pricing, but also industry insight into best practices for microgrid
21 deployment directly on its system. If SCE&G identifies competitive projects that

1 provide system benefits, SCE&G anticipates applying to the Commission for
2 approval to move forward with the contracts and deployment.

3
4 **CONCLUSION**

5 **Q. WHAT IS SCE&G REQUESTING OF THE COMMISSION IN THIS**
6 **PROCEEDING?**

7 A. SCE&G respectfully requests that the Commission approve the Company's
8 costs incurred in providing DER programs during the Review Period as being
9 reasonable and prudent and find that the Company's fuel purchasing practices were
10 reasonable and prudent for the Review Period.

11
12 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

13 A. Yes.